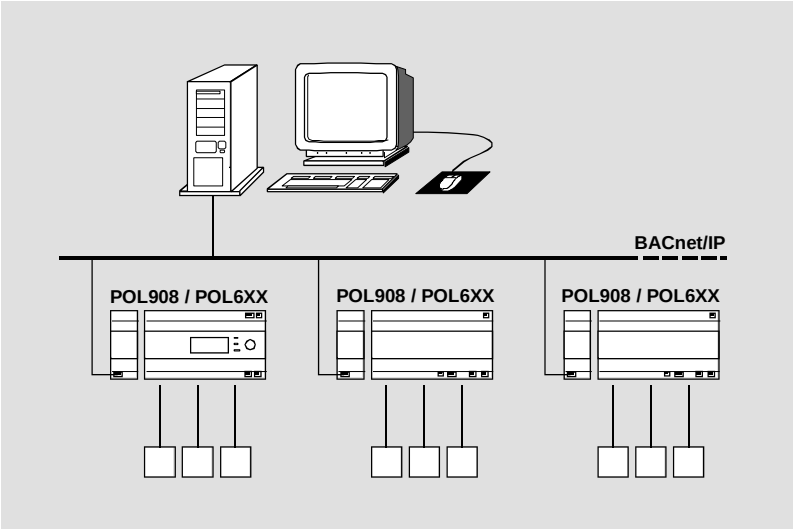


# Climatix™
# BACnet/IP communication with POL908.00
## Integration guide

CB1J3962en
26.03.2010

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# 1 About this document

## 1.1 Revision history

| Version | Date | Changes | Section | Pages |
|---|---|---|---|---|
| | 26.03.2010 | First edition | | |
| | | | | |

## 1.2 Before you start

**Validity**

This document applies to the following product:

| Name | Type (ASN) | Short name |
|---|---|---|
| BACnet/IP communication module | POL908.00/STD | BACnet/IP module |

Product versions

Description and functional scope of the products are based on the Climatix Valid Version Set 8.0 or higher and application based on Siemens standard.

**Target audience**

This document is intended for the following audience:

- BACnet system integrators
- Measuring and control engineering staff
- Sales and commissioning staff

**Prerequisites**

The above target audience:

- Has general professional knowledge on planning and commissioning HVAC technology measuring and control solutions.
- Has basic knowledge of BACnet.
- Has the additional reference addresses documentation for the specific product.

## 1.3 Reference documents

**Further information**

The following documents contain additional information on the products described in this manual:

| Document | Order no. |
|---|---|
| Data sheet "Communication module BACnet/IP" | CB1Q3933en |
| Basic documentation "BACnet communication modules" | CB1P3933en |
| Basic documentation "BACnet PICS" | CB1P3939en |
| BACnet objects "BACnet/IP communication with POL908.00" Note! Uniqe documentation for each application. | CB1Y3963en |
| Basic documentation “Standard Application AHU” | CB1P3977en |

## 1.4 Document conventions

**Symbols used**

Below is an overview of all symbols used in this document denoting risks or important information:

This symbol draws your attention to special safety notes and warnings. Failing to observe these notes may result in injury and/or serious damages.

This symbol denotes special information that, when failed to observe, may result in faulty functionality *or loss of data*.

Notes with this symbol provide important information that requires appropriate attention.

This symbol marks passages containing tips and tricks.

**Abbreviations**

The following abbreviations are used in text and illustrations:

| Abbreviation | Meaning |
|---|---|
| BACnet | **B**uilding **A**utomation and **C**ontrol **N**etwork |
| BSP | **B**oard **S**upport **P**ackage (operating system) |
| Climatix | Controller family with common tools |
| Gateway | A device for transfer data between different kind of networks |
| HMI | **H**uman **M**achine **I**nterface, e.g Operator unit |
| HMI-DM | Climatix **D**ot **M**atrix HMI, POL895.51 |
| HVAC | **H**eating, **V**entilating, **A**ir **C**onditioning |
| MS | **M**anagement **S**tation |
| SELV | **S**afety **E**xtra-**L**ow **V**oltage |
| TCP/IP | **T**ransmission **C**ontrol **P**rotocol, e.g. Ethernet/Internet |

## 1.5 Important information on safety

**Field of application**

Use Modbus communication only for control and monitoring.

**Intended use**

Trouble-free and safe product operation of the above products presupposes transport, storage, mounting, installation, and commissioning as intended as well as careful operation.

**Electrical installation**

Fuses, switches, wiring and grounding must comply with local safety regulations for electrical installations.

**Wiring**

When wiring, strictly separate AC 230 V mains voltage from AC 24 V safety extra-low voltage (SELV) to protect against electrical shock!

**Commissioning and maintenance**

Only qualified staff trained accordingly may prepare for use, commission, and maintain Modbus communication modules.

**Maintenance**

Maintenance of Climatix Controller and Modbus communication modules generally only means regular cleaning. We recommend removing dust and dirt from system components installed in the control panels during standard service.

**Faults**

Only authorized staff may diagnose and correct faults and recommission the plant. This applies to working within the panel as well (e.g. testing or changing fuses).

**Storage and transport**

Refer to the environmental conditions specified in the respective data sheets for storage and transport.
If in doubt, contact your supplier.

**Disposal**

Devices contain electrical and electronic components; do not dispose of them in household garbage.
**Observe all local and applicable laws**.

## 1.6 Trademarks and copyrights

**Trademarks, legal owners**

The table below lists the third-party trademarks used in this document and their legal owners. The use of trademarks is subject to international and domestic provisions of the law.

| Trademarks | Legal owner |
|---|---|
| BACnet | American National Standard (ANSI/ASHRAE 135-1995) |

All product names listed in the table are registered (®) or not registered (™) trademarks of the owner listed in the table. We forgo the labeling (e.g. using the symbols ® and ™) of trademarks for the purposes of legibility based on the reference in this section.

**Copyright**

This document may be duplicated and distributed only with the express permission of Siemens, and may be passed on only to authorized persons or companies with the required technical knowledge.

## 1.7 Quality assurance

**Document contents**

These documents were prepared with great care.

- The contents of all documents are checked at regular intervals.
- All necessary corrections are included in subsequent versions.
- Documents are automatically amended as a consequence of modifications and corrections to the products described.

Please make sure that you are aware of the latest document revision date.

## 1.8 Document use/ request to the reader

**Request to the reader**

Before using our products, it is important that you read the documents supplied with or ordered at the same time as the products (equipment, applications, tools etc.) carefully and in full.
We assume that persons using our products and documents are authorized and trained appropriately and have the technical knowledge required to use our products as intended.

**Exemption from liability**

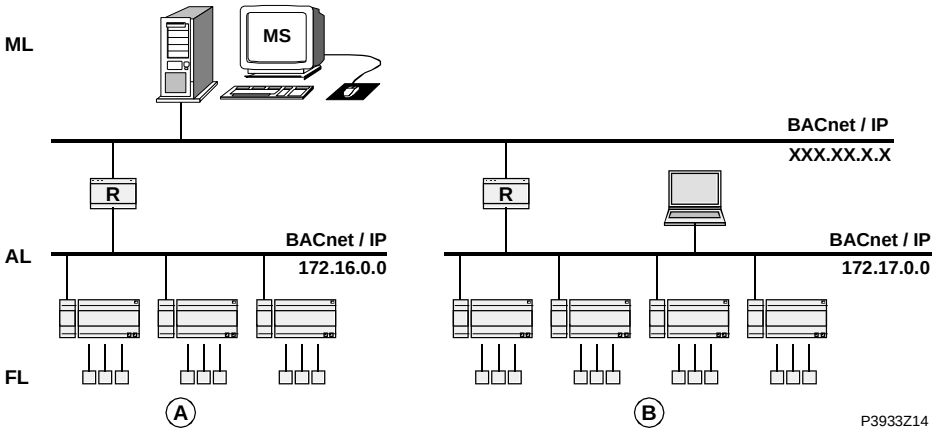
Siemens assumes no liability to the extent allowed under the law for any losses resulting from a failure to comply with the aforementioned points or for the improper compliance of the same.

# 2 BACnet/IP overview

## 2.1 Networks and addressing

**BACnet/IP networks**

A BACnet/IP network consists of one or more IP subnets (IP domains) assigned the **same** BACnet network number.



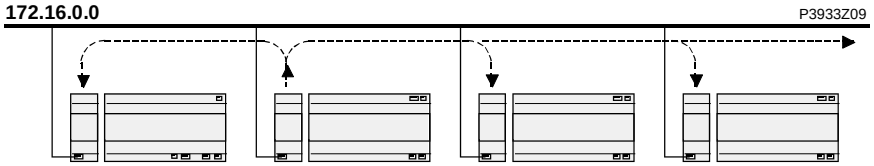

| | | | |
|---|---|---|---|
| ML | Management level | R | Router |
| AL | Automation level | FL | Field level |

**Broadcasts and BBMDs**

BACnet often uses broadcasts for communication. In contrast to unicasts, they are intended for all network members.
This must be considered when engineering IP subnets. BACnet uses the "BACnet Broadcast Management Device" (BBMD) as showed below.

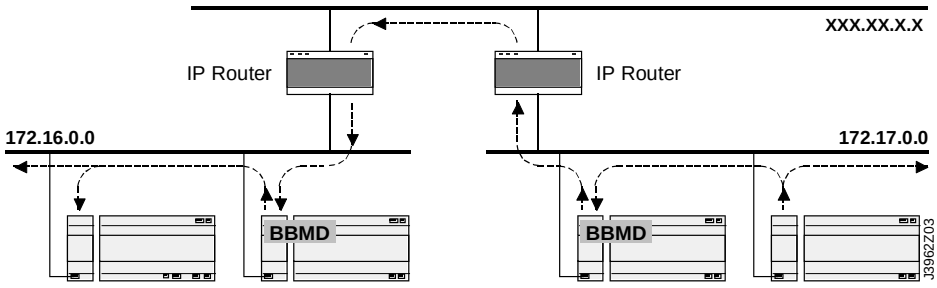
**One** IP subnet

Broadcast messages from a device (e.g. 172.16.255.255:0xBAC0) in BACnet/IP networks consisting of only **one** IP subnet are sent to all other subnet members as IP broadcasts without requiring an additional measure. *Example:*




**Several** IP subnets: BBMDs required

BBMDs transmit broadcasts to all other BBMDs on the BACnet network, thus distributing broadcasts across the corresponding subnets. Example:




**More information**

For more detailed information on BACnet/IP networks see documentation: CB1P3933en "Climatix BACnet communication modules POL904, POL908".

## 2.2 BACnet/IP limits

**DHCP rules**

Automatic assignment of DHCP may have an undesired effect on the system. Remember the following:

| Item | Rules |
|---|---|
| BBMDs | DHCP may **never** be used together with "BACnet Broadcast Management Devices" (BBMDs), as the IP addresses of the "Broadcast Distribution Table" (BDT) are configured as static addresses and cannot change during operation. |
| Alarm recipient | In BACnet, alarm recipients are entered with their "Device Object Identifier" or their BACnet address. The IP address is part of the BACnet address and may not be changed for the alarm recipient.<br>For this reason, option "Device Object Identifier" must always be used. |
| Access rights | If access rights are assigned based on IP address (e.g. for firewalls), the address must be static. |
| IP version | The BACnet standard currently supports only IP Version 4, i.e. only IP devices with 32 bit address that can be operated as BACnet/IP device. The BACnet protocol does not work with 128-bit addresses of IPv6. |

## 2.3 Climatix BACnet server functionality

**Supported standard**

The BACnet/IP module supports BACnet standard **B-AAC** (BACnet Advanced Application Controller).

**Limits for objects and COVs**

Limits for objects and COV subscriptions:

| Item | Number |
|---|---|
| Objects in device, total | max. 500 |
| BACnet objects, portion of total number | max. 300 |
| Simultaneous COV subscriptions | max. 50 |
| COVs on BACnet | max. 5 per sec |

**Object types supported**

The BACnet/IP module supports the following BACnet standard object types:

| Climatix object | BACnet object | Comment |
|---|---|---|
| Clock | Device | |
| aoDeviceGroup | Device | |
| aoDiagnostic | Device | |
| aoAnalogInput | AnalogInput | |
| aoAnalogOutput | AnalogOutput | |
| aoAnalogValue | AnalogValue | No Alarm |
| aoSetpointValue | AnalogValue | No Alarm |
| aoDisplayValue | AnalogValue | No Alarm |
| aoSetpointValueLimit | AnalogValue | No Alarm |
| aoBinaryInput | BinaryInput | |
| aoBinaryOutput | BinaryOutput | |
| aoBinaryValue | BinaryValue | |
| aoMultistateInput | MultiStateInput | |
| aoMultistateOutput | MultiStateOutput | |
| aoMultistateValue | MultiStateValue | |
| aoSetpointMultistate | MultiStateValue | No Alarm |
| aoDisplayMultistate | MultiStateValue | No Alarm |
| aoSchedule | Schedule | No Alarm |
| aoScheduleWord | Schedule | No Alarm |
| aoCalendar | Calendar | No Alarm |
| MessageClass | NotificationClass | |

In the future, this device may support other objects such as "LoopController" or "Trend".
For information on the current status, see:
CB1P3939en "Protocol Implementation Conformance Statement (PICS)"

**Different alarm handling**

Alarms of a BACnet client are handled differently from those of Climatix:
– In BACnet, each objects in alarm is acknowledged and reset as well as transitioned from "ToNormal", "ToOffNormal", and "ToFault".
– Climatix objects do not support this transition, but rather only transitions to "ToNormal". This is done via general acknowledgement for each object, not for each individual object in alarm.

The behavior described above means that acknowledgement and reset in BACnet does not impact pending/unhandled alarms in Climatix.
Acknowledgement in BACnet is only information that the alarm has been identified.

Workaround

The following workaround is needed to reset a BACnet alarm:
An additional BACnet object "MultiStateValue" named "Reset" is used for general acknowledgement in Climatix.

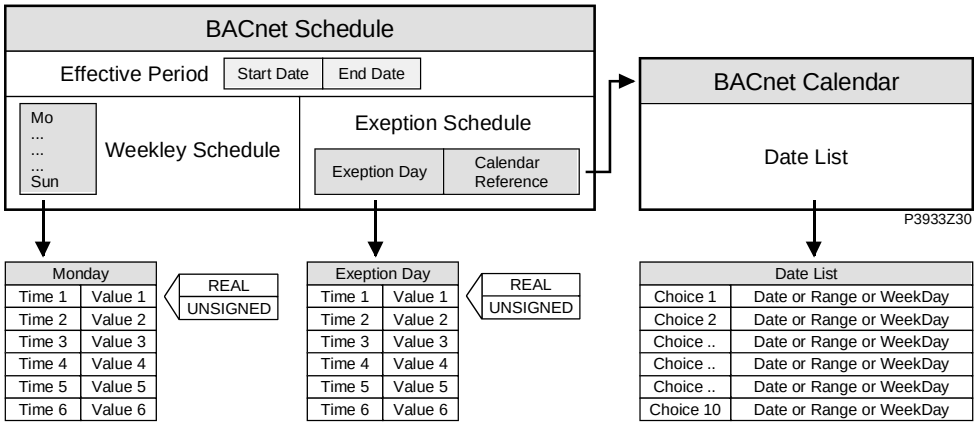
**Multistate objects**

BACnet does not use the value 0 for Multistate objects. All Multistate objects start with 1. Climatix may use Multistate objects even if there are only 2 states (e.g. Off/On).

See the following document for "BACnet Interoperability Building Blocks" (BIBBs) and standard object types etc. supported:
CB1P3939en "Protocol Implementation Conformance Statement (PICS)"

**Schedule and Calendar**

The figure shows the Climatix schedule concept for BACnet:




Explanations (figure)

The elements and functions in the figure are:

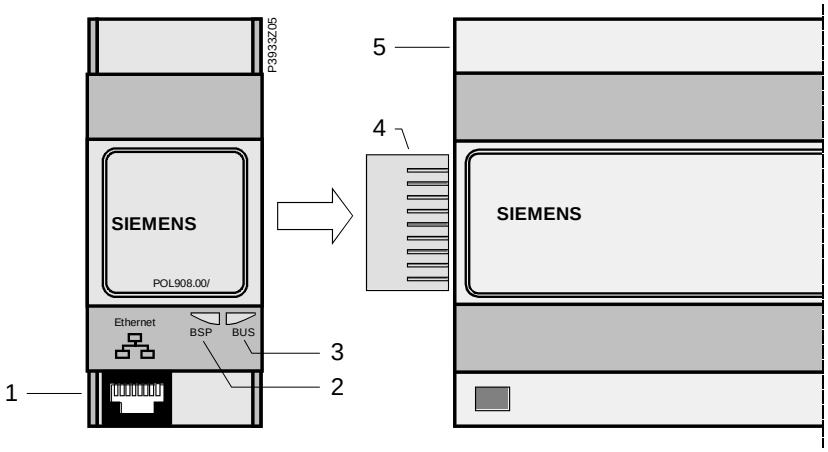
| Element | Function |
|---|---|
| BACnet Schedule | BACnet object "Schedule" defines a weekday and exception day program as well as an actual time period during which the schedule is active. |
| Weekly Schedule | Each day – from Monday to Sunday as well as the exception day – allows for six different entries "Time/Value". Value REAL(FLOAT), DIGITAL, or UNSIGNED (multistate) depends on the Climatix object connected to the program. |
| Exception Schedule | Climatix only offers one exception day. It refers to the BACnet Calendar object. The exception day is defined like any day of the weekly schedule. The BACnet calendar then determines when the exception day is active. It takes priority over the weekly schedule. |
| BACnet Calendar Exception | The BACnet "Calendar" object is a list with "Date" **or** "Range" **or** "WeekNDay" (weekday) entries. The exception day of a related schedule is active when the entry is selected via the BACnet calendar. |
| *BACnet Calendar Off* | *The BACnet "Calendar" object is a list with "Date" **or** "Range" **or** "WeekNDay" (weekday) entries. The plant is set to off when the entry is selected via the BACnet calendar.* |
| *Date* | *Date* defines a start date. The present value is active for this date.<br>– *Example 1:* *,07/04/25 (April 25, 2007).<br>– *Example 2:* Sun,*/04/25 (each 25th of April, provided it is a Sunday). |
| *Range* | Date range defining start and end date. The present value is active for this range.<br>Entry format: Same as for *Date*. |
| *WeekDay* | This entry allows for selecting a special day as exception day.<br>Entry format:<br>Week of month (number), day (name), month.<br>– *Example 1:* 02/Mo/Mar (second Monday in March, every year).<br>– *Example 2:* */Tu/* (every Tuesday). |

# 3 Commission instructions

## 3.1 BACnet/IP module, elements

**Design**

The figure shows the Climatix BACnet/IP module POL908.00/STD. It is connected to the Climatix controller via the internal communication extension bus. This is done via plug connection on the left side of the controller.




**Elements and connections**

The elements and connections in the figure are:

| Pos. | Element / Connection |
|---|---|
| 1 | Ethernet interface 10/100 Mbit (IEEE 802.3U), RJ45 plug, 8-pin. |
| 2 | Status display "BSP" (Board Support Package). |
| 3 | Status display "BUS" (bus connections / bus traffic o.k.). |
| 4 | Plug connection "Communication extension bus". |
| 5 | Climatix controller POL6XX. |

**Status LEDs**

The status LEDs "BSP" and "BUS" can light red, green and yellow during operation.

"BSP" LED

This LED informs on the status of the "Board Support Package" (BSP). Color and flashing frequency of the LED:

| Color | Flashing frequency | Meaning / Mode |
|---|---|---|
| Red / yellow | 1 s "on" / 1 s "off" | Upgrade mode. |
| Green | Steady "on" | BSP operating and communication with controller working. |
| Yellow | Steady "on" | BSP operating, but no communication with controller. |
| Red | Flashing at 2Hz | BSP error (software error). |
| Red | Steady "on" | Hardware fault. |

"BUS" LED

This LED shows the status of external communication with the bus, not to the controller. Color and flashing frequency of the LED:

| Color | Flashing frequency | Meaning / Mode |
|---|---|---|
| Green | Steady "on" | Communication active. |
| Red | Steady "on" | Communication interrupted. |
| Yellow | Steady "on" | Initializing – no communication yet via IP. |

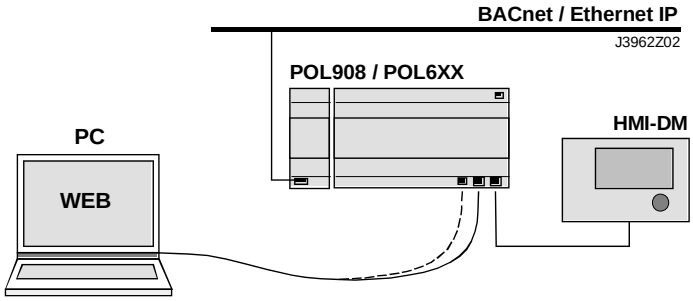
Power supply is outside the allowed range if both LEDs are dark.

## 3.2 Connect BACnet/IP module

Prerequisites for connecting and configuring:
Working application loaded and started in the Climatix controller.

**Devices involved**

The Climatix controller and the BACnet/IP communication module are involved in this action:




**Tools needed**

Tools needed for connecting and configuring:
– Operator unit (HMI-DM).
– PC with web browser.

**Connect BACnet/IP module**

Proceed as follows to connect the BACnet/IP module to the bus:

| Step | Action |
|---|---|
| 1 | Controller **OFF**. |
| 2 | Connect BACnet/IP module to the controller via plug connection. |
| 3 | Connect the TCP/IP bus cable to the module. |
| 4 | Controller **ON**:<br>→ The module starts / initialization begins.<br>→ As soon as the two LEDs "BSP" and "BUS" are steady green, communication with the controller and bus (BACnet) is active.<br>*Caution!*<br>HMI-DM must be reset a second time to update; prior to parameterization |

**Next: Configure BACnet/IP module**

Next job is to configure the BACnet/IP module. There are two possible tools for configuring:

| Configure via … | Job | Section |
|---|---|---|
| Operator unit (HMI-DM) | TCP/IP settings → preferred tool | 3.3 |
| Module's web page | TCP/IP settings → alternative tool | 3.4 |
| | BBMD settings → only tool | 3.5 |

## 3.3 Configure module via HMI

**Basic settings / parameters**

Use the operator unit (HMI-DM) to enter BACnet basic settings.

Actual values and status is showed in the main page of the module, all settings are made in the sub pages for BACnet and TCP/IP.

| Parameters | Explanation |
|---|---|
| State | Current status of the communication module |
| Comm failure | Active = Communications error. |
| Device name | BACnet device name. |
| Device ID | BACnet device ID. |
| Port | BACnet port (UDP port), normally 0xBAC0 = 47808 |
| Imperial unit sys | Change dimensions to the imperial system. |
| Unicode | Set the parameter to "active" ("passive" is default) if Unicode characters are used. |
| Description lang | Language for the description field in EDE file and the description property on BACnet. The same texts as in the HMI-DM are used. |
| SecurityLevel | Set security level for BACnet. |
| Alarm server ID | Unique Alarm server ID (range 0…15) |
| Alarm device ID1-3 | Fix recipient device 1-3 |
| Comm mapping (Language) | Determines the objectnames, "Languages", used for all BACnet objects. Normally 16384 that is the same as COM1. |
| DHCP | DHCP active/passive. Passive = Fixed IP address |
| WINS name | WINS name on the TCP/IP network. |
| IP | Module IP. Actual in the main page for the module. |
| Mask | Module mask. Actual in the main page for the module. |
| Gateway | Module gateway. Actual in the main page for the module. |
| Software version | Module BSP version. |
| Use default | Reset to default settings. |

**Procedure**

Proceed as follows to configure the BACnet/IP module step by step:

| Step | Action |
|---|---|
| 1 | Log in to HMI-DM using the password for level 4 (Service), default 2000. |
| 2 | Go to **Main Index** > **System overview** > **Communication** > **Comm module overview** > **Module[x] BACnet IP** ><br>*Note! [x] is the position of the connected communication module. This is only information used when more than one module is connected.* |
| 3 | Go to **TCP/IP settings** ><br>The TCP/IP settings must be set up via HMI-DM to be able to connect to the web interface where BACnet and BBMD settings also can be done. |
| 4 | Select DHCP:<br>Active means that the IP address is given from a DHCP server on the network.<br>Passive means that a fixed IP address will be used as the settings described below. Fixed IP address must be used if using BBMD. |
| 5 | Select IP, Mask and Gateway:<br>The IP settings for the module are used for a fixed IP address and are only active if the DHCP parameter is set to Passive.<br>Note! End a line with #. Never use a “space” at the end.<br>These settings are not the same as the TCP/IP settings for the controller if a controller with inbuilt TCP/IP is used. |

# Configure module via HMI, *cont.*

**Procedure,** *cont.*

| Step | Action |
|---|---|
| 6 | Select **Write settings**:<br>Set Write settings to Active and go back to the main page of the module with ESC. This must be done after any new change in this page. |
| 7 | Go to **BACnet settings** ><br>All settings except the Description language can also be done via the web interface. In that case only select the Description lang and then go to the last step. |
| 8 | Select **Device name**:<br>The Device name must be unique within the BACnet network.<br>The last part in the default name is taking from the mac address of the module and is therefore always unique. |
| 9 | Select **Device ID**:<br>The Device ID must be unique within the BACnet network.<br>The default ID is always unique. |
| 10 | Select **Port**:<br>The default UDP port for BACnet is hexadecimal BAC0 (decimal 47808).<br>The Port can only be set up as decimal conversion (47808-47823).<br>BAC0=47808; BAC1=47809…BACF=47823 |
| 11 | Select **Description lang**:<br>Language for the description field in EDE file and the description property on BACnet. The same selections and texts as in the HMI-DM are used. |
| 12 | Select **Alarm device IDs**:<br>Up to three fixed alarm recipients can be entered to have a fast update of all alarms. Enter the BACnet device ID of the alarm recipient/client. |
| 13 | Select **Reset required !!**:<br>When done, restart controller using this command by first go back two pages with ESC. |

After restart, the BACnet module is configured and ready to use.

See further instructions how to set up BBMD if this must be used.

As a matter of principle, the controller must be restarted with “Reset required !!” or power off/on the controller after changing any settings to assume the data.

Other setting than described above are only options and should normally not be changed.

## 3.4 Configure module on web page

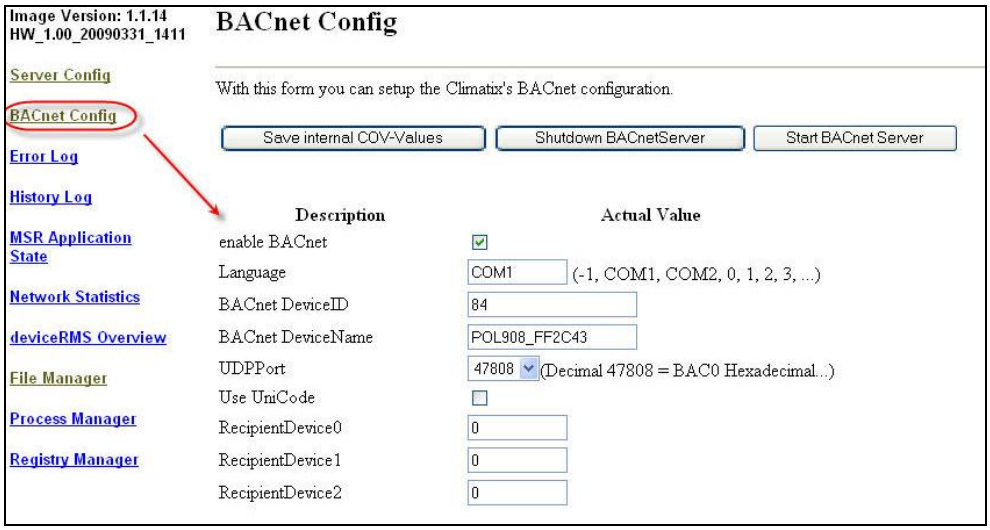
**Two tasks**

We differentiate between the following tasks:

1. Enter basic settings – if not done via operator unit (HMI-DM).
   See this section.
2. Enter BBMD settings (incl. any foreign devices).
   See section 3.5.

**BACnet Config menu**

The basic settings are entered via the **BACnet Config** menu:




P3933O04

**Basic settings**

Proceed as follows to enter the basic settings:

| Step | Action |
|---|---|
| 1 | Enter the IP address or WINS name in the browser to open the module's web page. |
| 2 | Select the tic for **enable BACnet**. |
| - | Language should normally be COM1 (16384). Same as Comm mapping |
| 3 | Select **Device ID**:<br>The Device ID must be unique within the BACnet network.<br>The default ID is always unique. |
| 4 | Select **Device name**:<br>The Device name must be unique within the BACnet network.<br>The last part in the default name is taking from the mac address of the module and is therefore always unique |
| 5 | Select **UDP Port**:<br>The default UDP port for BACnet is hexadecimal BAC0 (decimal 47808).<br>The Port can only be set up as decimal conversion (47808-47823).<br>BAC0=47808; BAC1=47809…BACF=47823 |
| - | UniCode should normally not be active. |
| 6 | Select **Recipient devices**:<br>Up to three fixed alarm recipients can be entered to have a fast update of all alarms. Enter the BACnet device ID of the alarm recipient/client |
| 7 | Press the “Save all values” button. |

STOP

Any changes on the BACnet Configuration Page needs a restart of the BACnet server by Shutdown and Start the BACnet server again.

# 3.5 Configure BBMDs

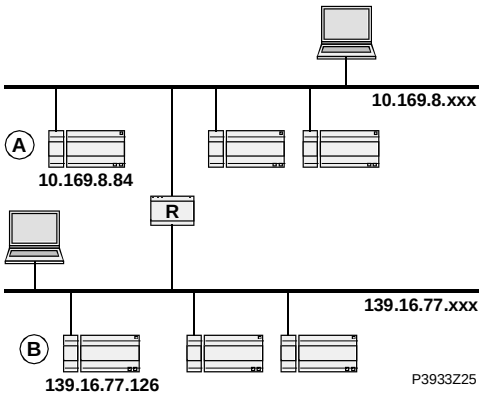
**BBMD settings**

You must define and parameterize "BACnet Broadcast Management Devices" (BBMDs) if a BACnet/IP network comprises several subnets. This allows for broadcasts via routers to all network members.

BBMD settings can only be done via web.

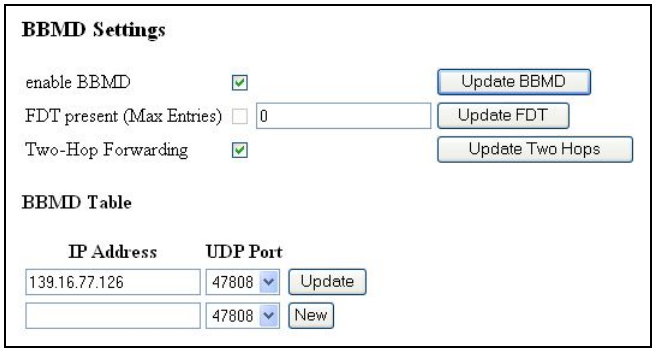
**Application example without foreign device**

The following network with two subnets only contains servers (controllers) and to set connected clients (PCs). All members can communicate with each other if one BBMD is defined per subnet.




**"BBMD Settings" window**

The web page for the corresponding controller offers the BBMD Settings window to parameterize BBMDs (here: Controller A):




P3933O05

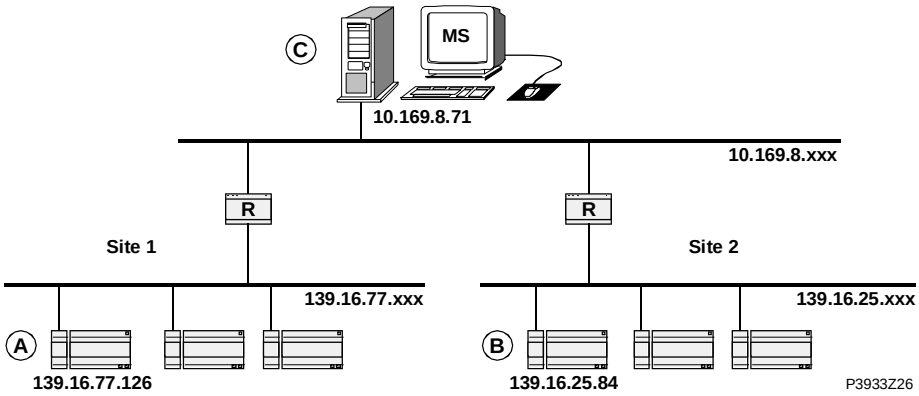
Settings

The window offers the following options:

| Element | Description |
|---|---|
| Enable BBMD | Select BBMD function for this controller. |
| Update BBMD | Assume settings and refresh display. |
| FDT present | Checkbox: Foreign Device Table yes / no<br>Text field: Max. number of entries (possible foreign devices). |
| Update FDT | Assume settings and refresh display. |
| Two-Hop Forwarding | Select two-hop forwarding. |
| Update Two Hops | Assume settings and refresh display. |
| IP Address | IP address for the partner BBMD on other subnet, e.g. for the above case:<br>– Partner for controller "**A**": **139.16.77.126**<br>– Partner for controller "**B**": **10.169.8.84** |
| UDP Port | Same as in the basic BACnet settings. |
| Update | Assume settings and refresh display. |
| New | IP address for BBMD server in an third subnet. *Important:* Enter the setting for all three BACnet servers! |

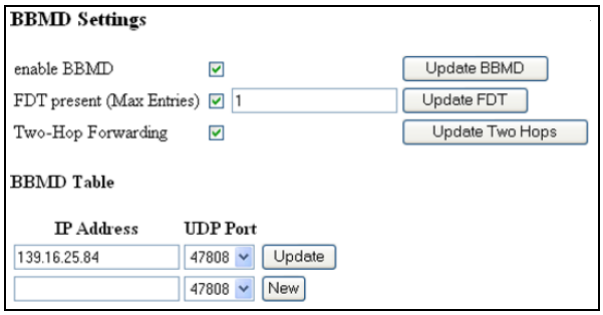
**Application example with foreign device**

The following topology contains:
- Two BBMDs "A" and "B".
- One foreign device "C" (MS / BACnet client).




Settings for controller "A"

Enter the settings again via window "BBMD Settings" for the respective controller:

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Explanations

Differences to the application example without foreign device on the previous page:
1. Checkbox **FDT present** is selected.
2. Text field **Max. Entries** contains "**1**" (for MS "C").

Settings for controller "B"

Same settings as for controller "A", but with the following difference:
The **IP Address** is **139.16.77.126**

Other setting than describe above are only options and should normally not be changed

Any changes on the BACnet Configuration Page needs a restart of the BACnet server by Shutdown and Start the BACnet server again.

FD settings in BACnet client (C)

Enter the IP addresses of the BBMDs, i.e. for controllers "A" or "B".

**Blank page**

# 4 Integration

## 4.1 General

Climatix can be integrated to any BACnet client that supports BACnet/IP. Special care must be taken to the BACnet standard and what object types and properties that are supported both on the Climatix and the client side.

## 4.2 BACnet objects types

**Overview**

Climatix supports the object types listed below:

| Object type | Supported | Can be created dynamically | Can be deleted dynamically |
|---|---|---|---|
| Analog Input | ☒ | ☐ | ☐ |
| Analog Output | ☒ | ☐ | ☐ |
| Analog Value | ☒ | ☐ | ☐ |
| Binary Input | ☒ | ☐ | ☐ |
| Binary Output | ☒ | ☐ | ☐ |
| Binary Value | ☒ | ☐ | ☐ |
| Calendar | ☒ | ☐ | ☐ |
| Command | ☐ | ☐ | ☐ |
| Device | ☒ | ☐ | ☐ |
| Event Enrollment | ☐ | ☐ | ☐ |
| File | ☐ | ☐ | ☐ |
| Group | ☐ | ☐ | ☐ |
| Loop | ☐ | ☐ | ☐ |
| Multi-State Input | ☒ | ☐ | ☐ |
| Multi-State Output | ☒ | ☐ | ☐ |
| Multi-State Value | ☒ | ☐ | ☐ |
| Notification Class | ☒ | ☐ | ☐ |
| Program | ☐ | ☐ | ☐ |
| Schedule | ☒ | ☐ | ☐ |
| Averaging | ☐ | ☐ | ☐ |
| Trend Log | ☐ | ☐ | ☐ |
| Life-Safety-Point | ☐ | ☐ | ☐ |
| Life-Safety-Zone | ☐ | ☐ | ☐ |
| Accumulator | ☐ | ☐ | ☐ |
| Pulse-Converter | ☐ | ☐ | ☐ |

**Description**

See the following basic document for a detailed description of the individual object types:

CB1P3939en
"BACnet Protocol Implementation Conformance Statement (PICS)"

## 4.3 BACnet objects

**Use the right document for actual application**

All available BACnet objects are found in a separate document and are specific for the actual application. All different applications, and in some cases also application versions, have different BACnet objects. The specific document for the actual application must be used to see what BACnet objects that are used.

The actual application name and version can be found using the HMI-DM. In some cases it is also good to check the controller BSP version.

**Check actual application**

Proceed as follows to see the actual application name and version:

1. Log in to HMI-DM using the password for level 4 (Service), default 2000.
2. Select **Main Index > System overview > Application info >**

| Parameter | Explanation / Example |
|---|---|
| Application manufacturer | e.g. Siemens |
| Application name and version | e.g. STD_AHU_vX.XX |
| Date | Application creation date; can be changed by application manufacturer |
| Name | e.g. plant name. |
| Street | e.g. plant address. |
| City | e.g. plant address. |

**Check actual controller BSP version**

Proceed as follows to see the actual controller BSP version:

1. Log in to HMI-DM using the password for level 4 (Service), default 2000.
2. Select **Main Index > System overview > Target >**

| Parameter | Explanation / Example |
|---|---|
| BSP version | Controller operating system. |

All present BACnet objects for the specific unit are found in the EDE files.
See next chapter how to export the EDE files.

**Priority array definition**

Climatix uses the command priority levels according to the following table:

| Priority level | Usage | Remarks |
|---|---|---|
| 1 | Service, configuration | Output always 0 |
| 2 | Not used | |
| 3 | Not used | |
| 4 | Alarm or force | Output always 0 |
| 5 | Force | Output according to settings |
| 6 | Min runtime | Output keeps the last state for set time |
| 7 | Not used | |
| 8 | Manual control from HMI | Output according to selected value |
| 9 | Room unit | |
| 10 | Set back analog outputs to NULL | |
| 11 | Not used | |
| 12 | Not used | |
| 13 | Not used | |
| 14 | Communication control | |
| 15 | Normal control | |
| 16 | Time switch program | Default value |

## 4.4 Export EDE files

**What are EDE files?**

EDE = "Engineering Data Exchange" is the format recommended by the BACnet Interest Group Europe to exchange data between BACnet server and BACnet client.

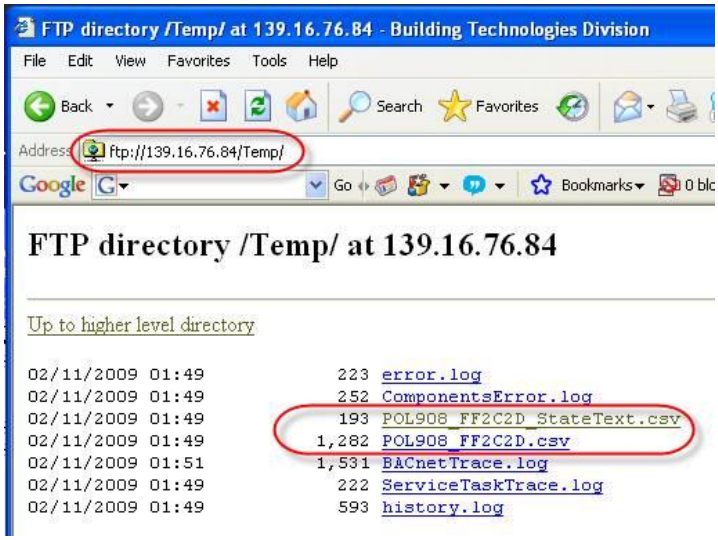
EDE Export files containing information on the BACnet objects are required for offline integration in a management station if it is not supports online integration.

The EDE files are created by the BACnet server at every start of the server. It is needed to download and import new files if there is any change in controller configuration, that adds new BACnet objects, or change in BACnet settings.

**Procedure for export**

These files can be exported via ftp as follows:

| Step | Action |
|---|---|
| 1 | Open **ftp** for the module in the browser (Internet Explorer):<br>**ftp://IP address** of the module. |
| 2 | Go to **Temp** and save the two files selected in the screenshot below. |


FTP directory /Temp/ at 139.16.76.84 - Building Technologies Division
File Edit View Favorites Tools Help
Back Search Favorites
Address ftp://139.16.76.84/Temp/
Google Go Bookmarks
FTP directory /Temp/ at 139.16.76.84
Up to higher level directory
02/11/2009 01:49 223 error.log
02/11/2009 01:49 252 ComponentsError.log
02/11/2009 01:49 193 POL908_FF2C2D_StateText.csv
02/11/2009 01:49 1,282 POL908_FF2C2D.csv
02/11/2009 01:51 1,531 BACnetTrace.log
02/11/2009 01:49 222 ServiceTaskTrace.log
02/11/2009 01:49 593 history.log

P3933O09

The EDE files are then used for offline integration, but could also be open in Excel to view what BACnet objects that are present.

Normally can either the object-name or the object-instance be used as a BACnet reference.

## 4.5 Configure Climatix as client

Description planned for the next version.

# 5 Other information

## 5.1 Troubleshooting, tips

**General**

General things to check:

- Check the actual application version and controller BSP version before call any support.
- As a matter of principle, the controller must be restarted with “Reset required !!” or power off/on the controller after changing any settings to assume the data.

**TCP/IP network**

Observe the following for TCP/IP network design and structure:

- Check that the DHCP parameter is set to “Passive” if fixed IP address should be used.
- Try to ping the controller if the communication is not working. If the ping fails something is wrong in the network or the IP settings.
- Check that the defined UDP port, e.g. BAC0, is open in the firewall.
- Use the character # at the end of all IP settings. Never use a “space” at the end.

**BACnet does not work**

Check the following if BACnet does not work:

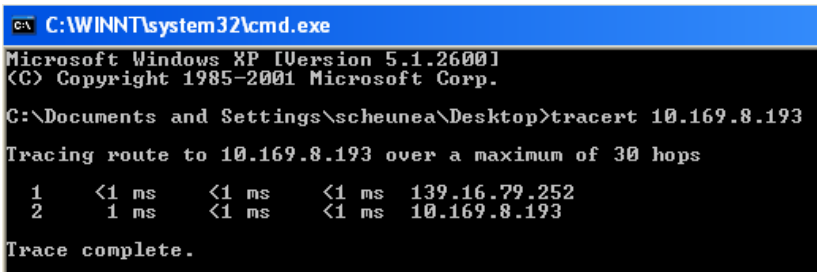
- Does the BACnet server run in the Process Manager (web)?
  File "BACnetApp.exe" must be visible.
- Do the EDE files exist?

Otherwise, start the BACnet server on the BACnet page.

**BBMDs required?**

BBMD must be used if BACnet client and BACnet server are located in different subnets.
Use command "tracert" to check this.

*Example (result):*


C:\WINNT\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\scheunea\Desktop>tracert 10.169.8.193
Tracing route to 10.169.8.193 over a maximum of 30 hops
1 <1 ms <1 ms <1 ms 139.16.79.252
2 1 ms <1 ms <1 ms 10.169.8.193
Trace complete.

Tracert shows all stations used to forward the signal to another segment.

**Device Name and ID unique?**

Make sure both Device Name and die Device ID are unique within the BACnet network.

**Note BACnet multistate objects**

BACnet multistate objects do not use value "0". They always start at "1".

## 5.2 FAQ on TCP/IP

**TCPI/UDP ports**

| Port number | Type | Used for … |
|---|---|---|
| 21 | | FTP |
| 23 | UDP | Telnet/Ping |
| 80 | | Web |
| 4242 | TCP | Scope, RemoteOPC TCP/IP |
| 47808 | UDP | BAC0 |
| 47809 | UDP | BAC1 |
| 47823 | UDP | BACF |

**IP address**

The IP address is assigned either dynamically via the DHCP server or set manually via HMI-DM as follows:

| Step | Action |
|---|---|
| 1 | Set parameter DHCP to **Passive**. |
| 2 | Change **IP address**. |
| 3 | Confirm by setting **Write settings** to **Active**. |
| 4 | Restart controller. |

**MAC address and WINS name**

The MAC address is the topmost number of the sticker on the communication module POL908. It always follows the same form: "00 A0 03 FF XX XX XX", where XX XX XX is a continuous number.
*Example:* 00 A0 03 FF 2C 9D
The WINS name is generated from the prefix POL908_ and XX XX XX (i.e. the last six digits of the MAC address).
*Example:* POL908_FF2C9D
You can also find the WINS name in the configuration settings in the HMI-DM.

**Web server**

Use the WINS address or IP address to successfully connect to the web server.
Example: *"http://POL908_XX XX XX" or "http://192.168.0.10"*
The web server uses TCP port 80 for communication.

**FTP server**

Use the same address as for the web server, but replace
"**http://**" by "**ftp://ADMIN@**" to successfully connect to the FTP server.
*Example: "ftp://ADMIN@POL908_FF2C40"*
The following setting must be selected in the Internet Explorer:
**Tools** > **Internet Options** > **Use Passive FTP** (for compatibility with firewalls and DSL modem).

Password

User name: ADMIN
Password: SBTAdmin!

**Network: Disconnected**

Ping the communication module using the WINS or IP address to test communications:

| Step | Action |
|---|---|
| 1 | Select **Start** > **Run** on the Windows start bar:<br>→ The "Run" dialog box opens. |
| 2 | Enter **CMD** and click **OK**:<br>→ The "CMD.exe" DOS window opens. |
| 3 | Enter **C:\>ping POL908_XX XX XX** and press **Enter**:<br>→ The ping result is displayed. |

You are dealing with a network or IP settings error if pinging does not work.

**Problems with security scan**

The SNMP service (Simple Network Management Protocol) may present a problem during a security scan by the network administrator.
You can disable the SNMP service.

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